SCOPE

MAGAZINE OF NAVY MEDICINE RESEARCH & DEVELOPMENT

ISSUE 10 WINTER 2026

NSMRL GENESIS CHAMBER RETURNS TO OPERATION

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Editor's Desk

Winter has been pouring snow and work down on us in equal measure this year, but as ever, Navy Medicine Research & Development has remained resilient, productive in our mission and impressive in our accomplishments, as this issue will attest.

Having covered the research efforts of our commands for four years now, I am impressed by the many ways all of you have helped, and continue to help, the service members who keep the nation safe. The scientific frontiers NMR&D advances are many and varied, more so than most people will ever know. It is a humbling privilege to communicate those advances to the world.

With the blooming of spring just around the corner, SCOPE looks forward to highlighting the many accomplishments NMR&D has ahead this year. Talk to you all soon!

— Sidney Hinds

THE SCOPE

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In this issue:

IPMHE 2025

NAMRU INDO PACIFIC representatives receive recognition for research efforts

Arctic Advances

NAMRU San Antonio looks to advance the state of extreme cold healthcare

Cold Comfort

NHRC researchers develop strategies and tools to help the U.S. warfighter survive cold-water exposure and complete the mission.

A New GENESIS

NSMRL restarts underwater research with the freshly renovated GENESIS chambers

15 Years of NAMRU Dayton

A look at the history and skies ahead for Naval Medical Research Unit Dayton

On the Cover:

NSMRL staff stand in front of the recently renovated GENESIS chamber

Emily Swedlund

NSMRL Diver Recognized as Chamber of Commerce of Eastern CT Serviceperson of the Year

By Emily Swedlund

Navy Diver 1st Class John Ahnen with Naval Submarine Medical Research Laboratory (NSMRL) was recognized by the Chamber of Commerce of Eastern Connecticut as their 2024-2025 Serviceperson of the Year (SPOY).

The SPOY award honors exceptional active-duty, reserve or National Guard servicemembers who demonstrate exemplary service to their branch and make a meaningful impact within their communities. The SPOY is selected by the chamber's Military Affairs Council from a pool of past Serviceperson of the Month (SPOM) winners, of which Ahnen was selected in November 2024.

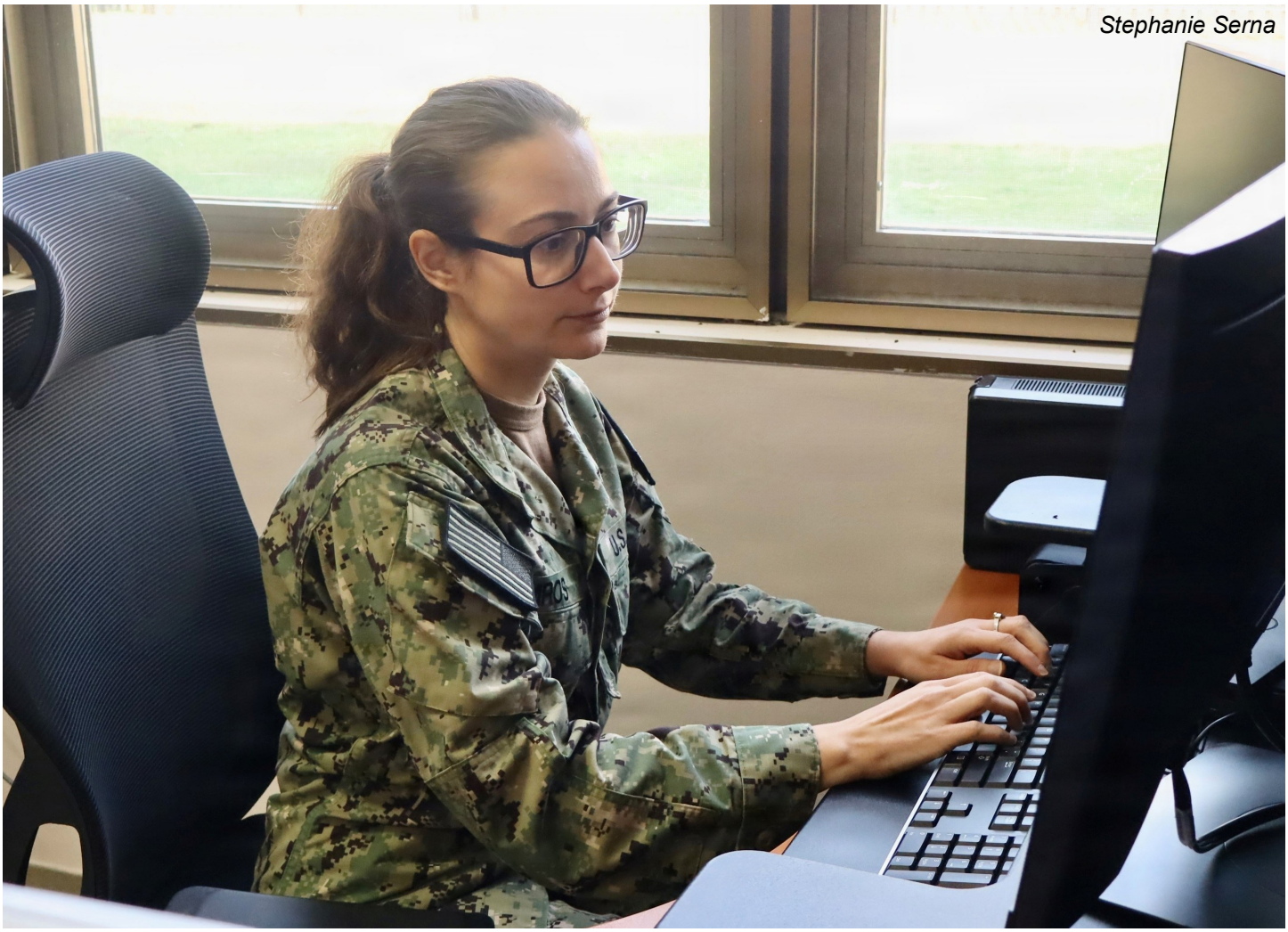
"This award supports recognition of outstanding military personnel sta-

"I really try to live by the 'just be helpful' mantra, so it's an amazing honor to be recognized for that"

tioned in the New London and Groton area who have not only excelled in their branch duties, but demonstrated a passionate commitment to acts of community service." said Elizabeth Lupo, co-chair of the Chamber of Commerce of Eastern CT Military Affairs Council.

The Chamber of Commerce of Eastern Connecticut hosted a celebratory breakfast at Port 'N Starboard in New London. In attendance were many local civic and military members including Capt. Craig E. Litty, commanding officer of Submarine Base New London.

Continued on page 42


Stephanie Serna

Advancing Fleet Readiness Through Infectious Disease Research at NAMRU EURAFCENT

By Stephanie Serna

Infectious disease poses a constant, evolving and ever-present threat to deployed U.S. forces. The Sailors at Naval Medical Research Unit (NAMRU) EURAFCENT, who work at the forefront of medical research, have a responsibility to survey and study this threat.

Cmdr. Christina Jamros supports U.S. service member health and operational readiness in this way as an infectious disease physician at NAMRU EURAFCENT. Her work directly contributes to medical research efforts that help the fleet prevent, identify and respond to infectious disease threats in the deployed environment.

"Success means ensuring our research leads to meaningful, lasting improvements for the fleet"

Jamros' work integrates clinical medicine with operational research. She provides infectious disease expertise to the command's ongoing studies, advises research teams during field operations and ensures findings are relevant to deployed medical forces.

"Every study and every data point contributes to improving care and protecting the health of those who serve," Jamros explained. "Success means ensuring our research leads to meaningful, lasting improvements for the fleet."

Continued on page 42

Capt. Robert Carpenter

NAMRU INDO PACIFIC Officers Earn Awards at IPMHE 2025

By Capt. Robert Carpenter

Officers assigned to Naval Medical Research Unit (NAMRU) INDO PACIFIC earned multiple awards at the Indo-Pacific Military Health Exchange (IPMHE) 2025, held Dec. 2 –5 in Yokohama, Japan. Hosted by U.S. Indo-Pacific Command, the event convened military medical leaders and researchers from across the region to advance dialogue on global health security, operational medicine, humanitarian assistance and disaster response, and medical research.

"IPMHE provides an opportunity to share our findings with partner militaries and strengthen collaborations that enhance force health protection"

"NAMRU INDO PACIFIC conducts mission-critical infectious diseases surveillance and research to protect U.S. forces operating in the Indo-Pacific," said Lt. Hoai Hallam. "IPMHE provides an opportunity to share our findings with partner militaries and strengthen collaborations that enhance force health protection."

Four NAMRU INDO PACIFIC officers received recognition for their research advancing medical readiness and resilience in a changing operational environment.

Hallam received an award for her oral presentation, "Development of a Rapid and Scalable Functional T Cell-based Assay for Severe Fever with Thrombocytopenia Syndrome Virus," advancing immunological tools for detecting emerging infectious diseases.

Lt. Cmdr. Adam Salyer was recognized for his poster presentation, *"Durability, Effectiveness, and Acceptability of Etofenprox- and Permethrin-Treated Uniforms and Metofluthrin Spatial Repellent Among Active-Duty Malaysian Armed Forces Soldiers,"* underscoring applied research to prevent vector-borne disease.

"These awards reflect the high quality of NAMRU INDO PACIFIC's research and the strength of our partnerships across the region"

Lt. Cmdr. Irina Etobayeva received an award for her oral presentation, "Surveillance of Multidrug-Resistant ESKAPEE Pathogens in Malaysia: Implications for Public Health and Military Readiness," addressing the growing operational impact of antimicrobial resistance.

Capt. Robert Carpenter

Capt. Robert Carpenter was recognized for his oral presentation, *"Long-term Immunity Against Novel and Known Strains of SARS-CoV -2 in U.S. Active-duty Warfighters: 2024 Variants,"* highlighting the role of vaccine boosters in sustaining operational readiness.

"These awards reflect the high quality of NAMRU INDO PACIFIC's research and the strength of our partnerships across the region," said Capt. Nicholas Martin, NAMRU INDO PACIFIC commanding officer. "Our participation at IPMHE reinforces our commitment to delivering relevant, responsive research that supports operational readiness."

In addition to the award-winning presentations, NAMRU INDO PACIFIC delivered multiple briefings at IPMHE 2025. Capt. Martin presented the command's decentralized approach to emerging infectious diseases research. Capt. Andrew G. Letizia presented on interoperable wastewater surveillance to enhance military medical readiness in the Philippines. Lt. Cmdr. Dawn L. Weir also presented a poster assessing zoonotic spillover risk of henipaviruses among security forces in Sabah, Malaysia, supporting early warning and mitigation of emerging zoonotic threats.

Of the 294 presentations delivered during the 2025 IPMHE , NAMRU INDO PACIFIC contributed 10 briefings to senior leaders and general officers from the United States and partner nations, highlighting the command's expertise in the areas of emerging infectious diseases, entomology, antimicrobial resistance and immunology. ■

Courtesy Photo

NAMRU San Antonio conducts Gap-Driven Research for Operations in Extreme Cold

By Burrell Parmer

To support the future warfighter, Naval Medical Research Unit (NAMRU) San Antonio researchers are taking part in Arctic Edge 2026 from 23 February to 13 March.

Arctic Edge, a U.S homeland defense exercise demonstrating U.S. military extreme cold weather capabilities in the arctic region, provides the NAMRU San Antonio Biomedical Systems Evaluation and Engineering (BSEE) team with an environment to evaluate medical procedures and devices.

The Arctic region is of increasing interest to the near peer adversaries of the U.S. for its tactical, political and economic advantages. Expansion of U.S. military operations into the Arctic to meet this challenge requires advances in medical support capabilities.

“The cold itself is a tactical consideration”

The arctic climate complicates Tactical Combat Casualty Care (TCCC) treatment, as casualties donned with large amounts of clothing layers, can make wound assessment and applying medical care, such as tourniquets, more difficult.

"Arctic Edge is a stark reminder that environmental factors are a key component of the battlespace,” explained Darrin Frye, chief science director for NAMRU San Antonio. “On Kodiak, the cold itself is a tactical consideration. Our successful integration of research and operational training in this environment has strengthened our strategic partnerships and will increase the lethality and resilience of our forces in maritime and land domains."

To assist U.S. armed forces in extreme cold environments, NAMRU San Antonio is conducting analysis on existing treatment protocols, and evaluating the medical equipment currently in use to ensure it functions properly in the extreme cold. These evaluations take part in place during the BSEE team's attendance at Arctic Edge and Ice Camp.

Last year, NAMRU San Antonio released research on one such protocol through "Task Analysis Tool to Evaluate Tactical Combat Casualty Care in the Extreme Cold," a study published in the Journal of Special Operations Medicine.

The task analysis tool consists of steps in casualty care being broken down into sub-tasks, and then further broken down into rudimentary steps.

For example, applying a chest seal might be broken down into steps including a blood sweep, exposure of the wound, a wound assessment, and then finally the actual chest seal application.

This analysis allows each step of these sub tasks to be graded in a go/no-go style grading form, for the evaluation of "if and why" a step could fail in the extreme cold. This task analysis creates a baseline which future changes to TCCC protocols for cold weather can be tested against, validating the new treatment procedures.

NAMRU San Antonio, in collaboration with Naval Health Research Center, hopes to perform these evaluations with medics in the field during Arctic Edge 2026 to learn where TCCC procedures could be further improved for the extreme cold.

Additionally, NAMRU San Antonio will examine medical equipment and other gear currently in use to ensure it functions properly in polar conditions. The command is focused on testing a large breadth of medical equipment (45 in total, primarily found on the Marine Authorized Medical Allowance Lists) to identify trends and potential points of failure.

MC1 Abigayle Lutz

Cameron Parks

"These items were tested in the Cold Regions Research Engineering Labs environmental chambers, in temperatures set at -40 C for further assessment of their specific material characteristics, as well as their accuracy," explained Andres Martinez Murillo, a BSEE Department biomedical engineer. "The results of these tests illustrated which equipment can be used in the arctic environment, and which equipment must be either replaced or possibly winterized by the manufacturer for future use."

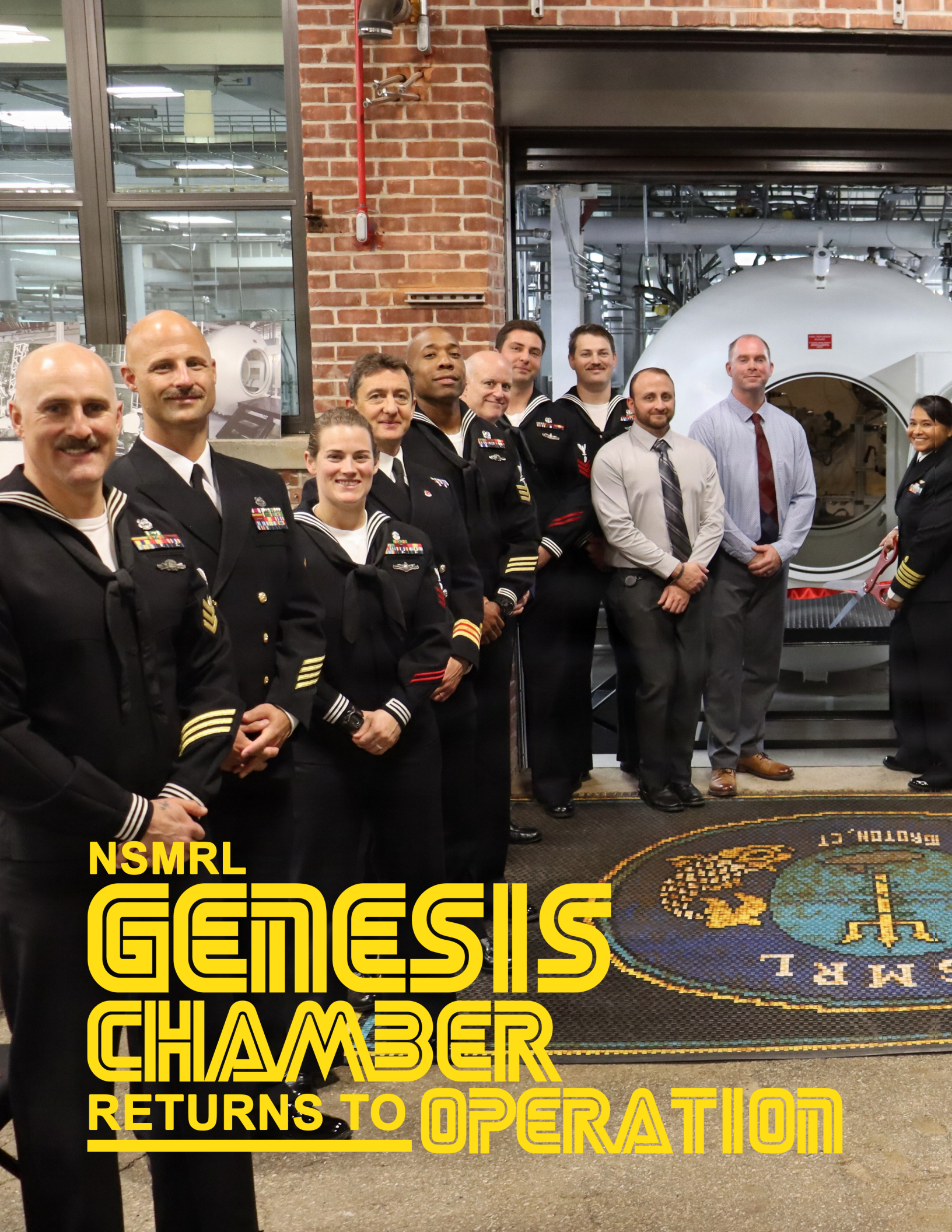
"The collaboration with our partners in polar medicine and tactical care was not just beneficial; it was essential," Frye added. "This initiative has produced actionable insights that will directly impact our operational readiness and our ability to provide superior care in the most demanding of cold-weather scenarios."

A technical manuscript is currently pending public release and will be available via the Defense Technical Information Center by the end of March 2026.

Previously, presentations of the task analysis tool were briefed to researchers at the 2025 Military Health System Research Symposium, as well at the 2025 Below Zero Medicine Conference.

"As one of the eight research commands within Navy Medicine Research & Development, NAMRU San Antonio routinely showcases its capabilities at various conferences through exhibits and presentations," said Martinez Murillo. "This has led to support from Special Operations Command to conduct further cold cycling and extreme cold evaluations on special operation forces medical kits, an ongoing project. This opens the door for the future growth of collaborations for research in the development of solutions that will advance warfighter readiness and treatment." ■

Courtesy Photo



NSMRL GENESIS CHAMBER RETURNS TO OPERATION

Story by
Emily Swedlund

Naval Submarine Medical Research Laboratory (NSMRL) marked the completion of a renovation of their hypo-hyperbaric chamber complex during a ribbon cutting ceremony in September 2025.

This renovated chamber, known as "Genesis," a multi-lock chamber certified for pressurization to a depth of 300 feet or an altitude of up to 70,000 feet, restores human hyper-hypobaric research capabilities to Navy Medicine Research & Development (NMR&D) for the first time since 2017.

Past research in the chamber complex has led to multiple scientific breakthroughs in the undersea and aerospace environments, providing important information about how humans can survive and function under high and low pressure. This information has been critical to informing equipment design, policies, and procedures for the health and safety of divers, submariners, and other warfighters operating in the undersea domain.

"The Genesis Chamber is a unique national asset," explained Capt. Tatana Olson, commanding officer of NSMRL. "One that will enable future advancements in hypo- and hyperbaric research to ensure the safety, survivability, and effectiveness of our warfighters operating in the most extreme environments."

NSMRL chamber complex is comprised of three different-sized hyper-hypobaric chambers, each with a slightly different purpose. Chamber 1, (Genesis), is the largest of the three. Chamber 2 is a smaller double-lock chamber, primarily designed for short duration dives. A third small chamber, used to test equipment, rounds out the complex.

The updated chamber is outfitted with high tech life-support systems, a modernized fire suppression system, cutting edge remote operability controls, and a vacuum pump capable of "flying" the chamber to 70,000 feet of atmosphere.

Lt. Tiffany Lui

NSMRL scientists are already using these updates to advance research on behalf of U.S. warfighters through three separate studies. One is to determine the necessary amounts of materials that can absorb carbon dioxide in case of a disabled submarine. A second study examines how the body's sympathetic nervous system acts while exposed to decompression stress. The final study is a collaboration with NASA to advance critical hypobaric decompression spaceflight research.

In 2017, NSMRL made the decision to completely overhaul and modernize the Genesis chamber. This overhaul, initiated in 2019, was the largest and most comprehensive update since the complex was installed in the early 1960s under the direction of Capt. George F. Bond.

Lt. Tiffany Lui

Bond's work defined the early years of the chamber's use. It was during his time as officer-in-charge that he signed a contract with the Bethlehem Corporation for a man-rated vacuum pressure climatized facility with hyperbaric oxygenation operations room capabilities. This was the world's first chamber specifically for research purposes, originally to prove the feasibility of saturation diving, or the ability for divers to go to great depths for long periods of time (thus reducing the time needed to decompress every time they surfaced), which was seen by many to be radical.

"Captain Bond was an exceptional man," explained Louis Deflice, NSMRL Dive Department head and a retired master diver. "During Project Genesis, he and his team proved the theory of saturation diving, which is now used in the diving industry worldwide. A bigger jump in manned deep sea diving capabilities hasn't happened since."

"NSMRL's early diving physiological studies set the standards that remain the foundation of today's more 'modern' work," Deflice added during his remarks at the chamber re-opening.

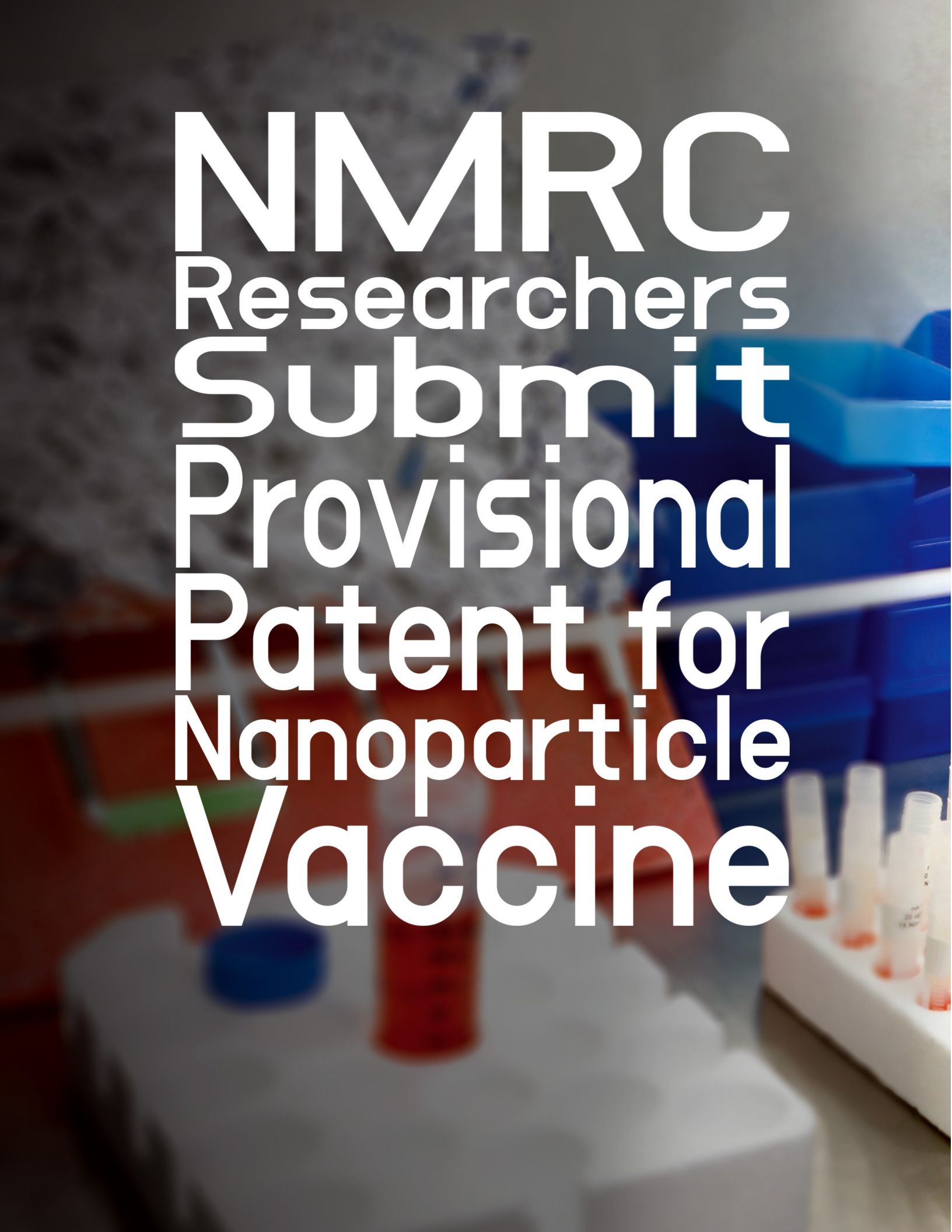
Although the inaugural Project Genesis is what gave the chamber complex its epithet, many other ground-breaking studies have been carried out in NSMRL's chambers throughout the years. In the late 1960s, a series of studies on nitrogen/oxygen dives resulted in recalculating the values used for decompression. In the 1970s, Project SHAD (Shallow Habitat Air Diving) used only compressed air as breathing gas, with divers spending up to thirty-days at depth, demonstrating that compressed air was a feasible alternative to more expensive helium/oxygen mixtures. Project Nisat focused on submarine crew rescue, emulating a scenario in which a crew had been trapped in a compressed air environment, and might be required to switch atmospheres during rescue.

Results from Project Nisat are still included in decompression tables used today.

Efforts in the 1980s and 1990s focused on non-pressurization research, studying how humans function in confined spaces and allowing researchers to draw conclusions about how submariners adjust to the confined submarine environment.

"As many incredible things that have happened in this chamber so far, I know that the things to come will be even better," said Deflice. "Someone at this lab right now could very well be the next George Bond and develop the next innovation in diving research right here."

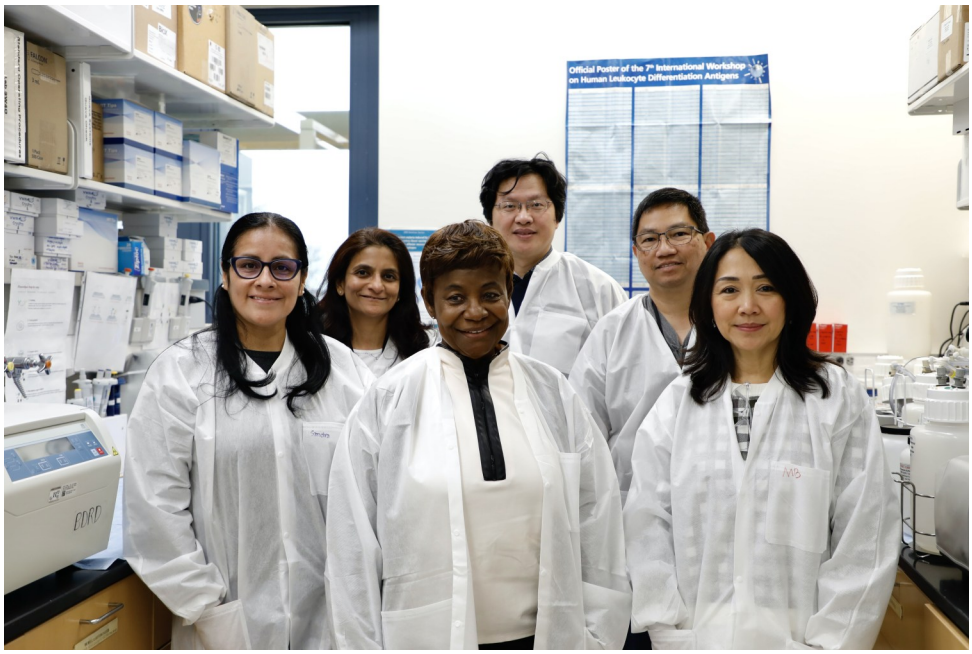
NSMRL, part of Navy Medicine Research & Development and based out of Groton, Connecticut, sustains the readiness and superiority of U.S. undersea warfighters through innovative health and performance research and works to lead the world in delivering science solutions to ensure undersea warrior dominance. ■


NMRC
Researchers
Submit
Provisional
Patent for
Nanoparticle
Vaccine

Story and photos by

Aleece Williams

Researchers at Naval Medical Research Command (NMRC) submitted a provisional patent for a nanoparticle vaccine to the U.S. Patent and Trademark Office on September 9. This vaccine development method is intended to prevent malaria but can also be used to develop vaccines against pathogens that develop in the liver.

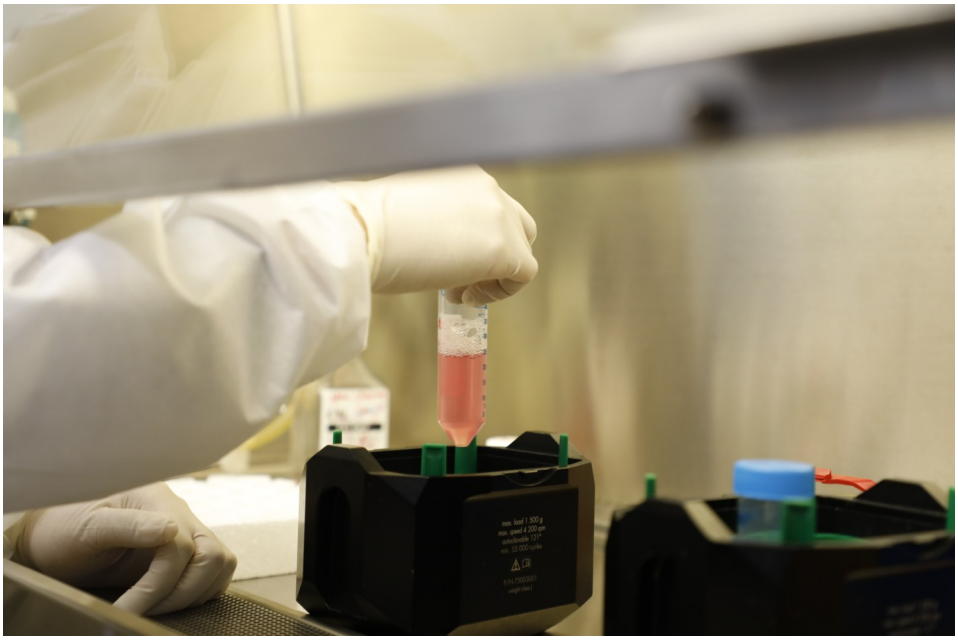


NMRC researchers study various infectious diseases that pose a threat to deployed warfighter health and readiness, to include malaria.

Malaria is a life-threatening disease contracted from being bitten by an infected mosquito and is most common in tropical areas. Developing a safe and effective malaria vaccine will benefit warfighter health by providing a line of defense against malaria, allowing them to safely and effectively support their mission.

"Just last year, 30 active and reserve service members were diagnosed with or reported to have malaria," said Martha Sedegah, NMRC director of Clinical Immunology and Parasitology, Agile Vaccines and Therapeutics Department. "When service members go out, they are confronted with unique challenges caused by the diseases in deployed environments, and we are developing preventive treatments to mitigate these challenges."

Researchers look forward to using this vaccine development model to develop similar preventive vaccines for other infectious diseases such as Lassa fever, SARS-CoV-2 and influenza. Lassa fever is a viral illness that is commonly found in West Africa and is a health concern. One in every five infections result in severe disease, including death. It can be contracted through contact with infected rodents, rodent excretions or person-to-person transmission.



"When service members go out, they are confronted with unique challenges caused by diseases in deployed environments, and we are developing preventive treatments to mitigate these challenges"

While many of these infectious diseases are preventable and curable, they can go undetected for weeks. Even if an illness goes undetected, it is still transmissible therefore posing a risk to those deployed or working in close quarters. Developing a vaccine against these harmful diseases can minimize initial illness, decreasing the likelihood of secondary illnesses, time away from work, lost time with family, etc.

"Malaria continues to cause an increasing medical concern for service members traveling to endemic regions while on leave, as 40% of malaria cases in 2024 occurred during non-duty travel," said Sedegah. "For service members traveling to malaria-endemic regions, pre-travel medication regimes should be emphasized."

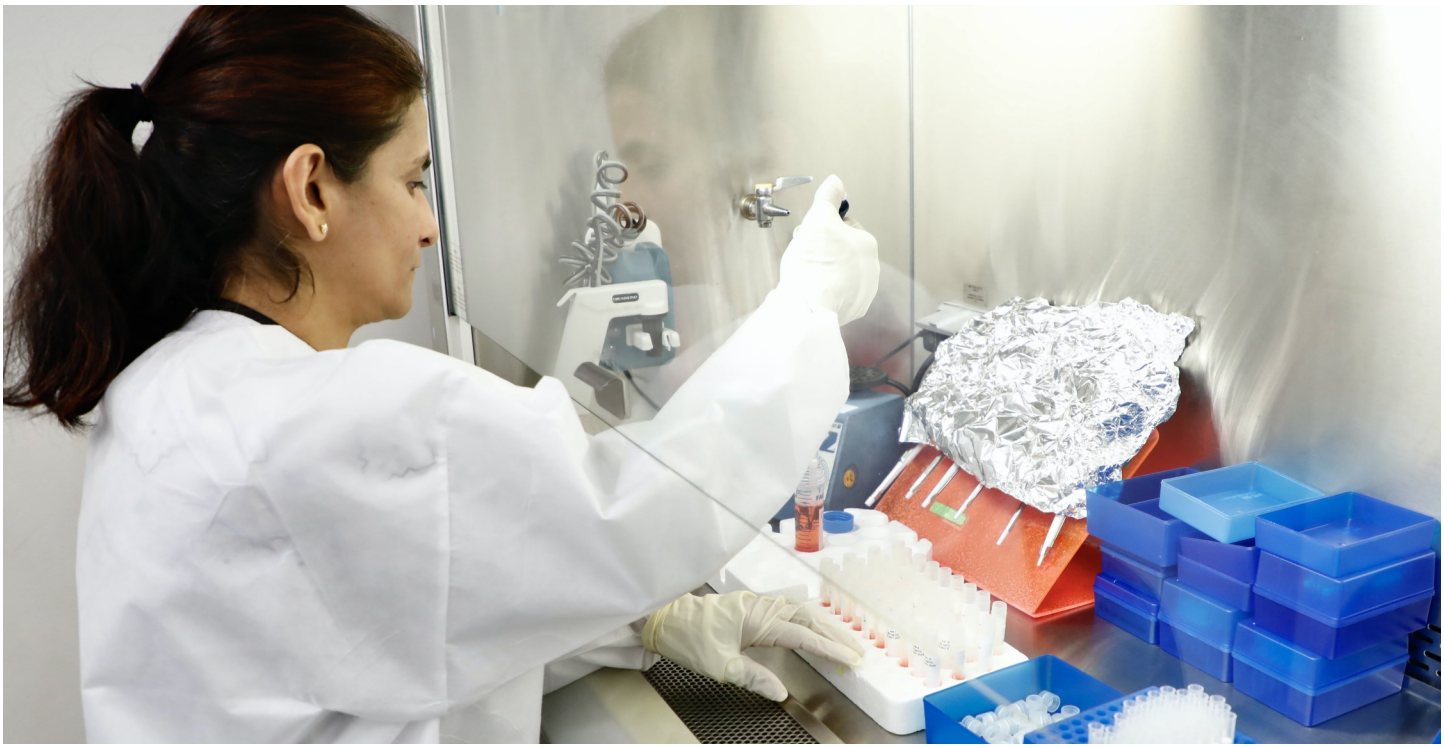
Submitting a provisional patent is the first step in ensuring the science of this vaccine development is protected from any entity duplicating or creating a similar product. Benefits of filing a provisional patent are establishing a patent application filing date for the invention and the ability for the inventor to deem their product, "patent pending."

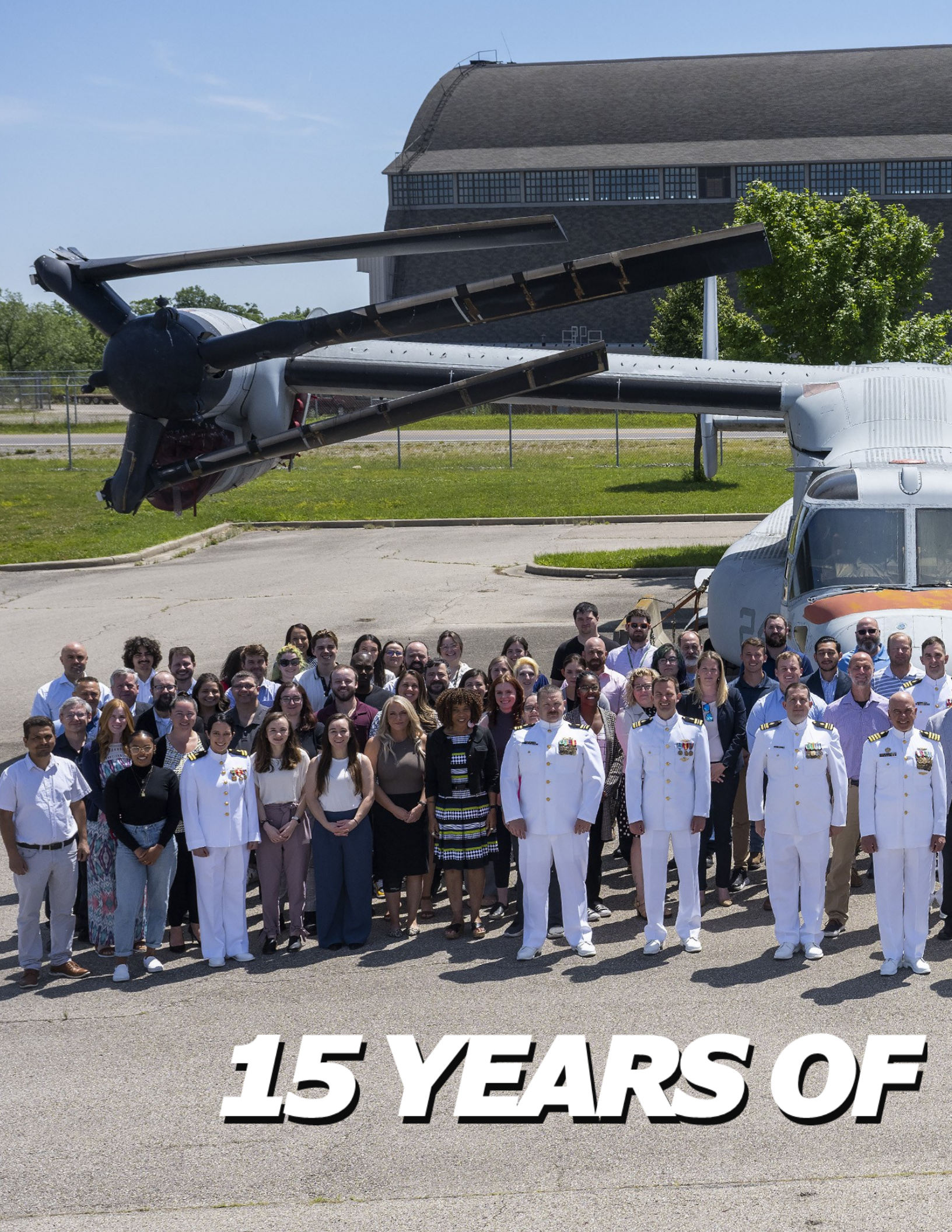
"For service members traveling to malaria-endemic regions, pre-travel medication regimes should be emphasized"

Once researchers obtain the patent for this vaccine, they will be able to collaborate with other researchers.

NMRC researchers frequently partner with other Navy Medicine Research & Development (NMR&D) commands stationed in various regions such as Africa. For infectious diseases common in tropical areas like Ghana, NMRC collaborates with Naval Medical Research Unit (NAMRU) EURAFCENT to bolster their studies and share new findings.

"We are excited to work and collaborate with our teams overseas such as NAMRU EURAFCENT in Ghana who we collaborate with to do meaningful research." ■




15 YEARS OF

NAMRU DAYTON

Story and photos by Zach Wilson

Naval Medical Research Unit (NAMRU) Dayton marked its 15th anniversary last year, commemorating a decade and a half of advancing Naval Medical Research and Development (NMR&D) efforts to strengthen the health, readiness and performance of U.S. service members.

The command hosted an observation event in October that highlighted both the creation of the Command as well as the celebration of the U.S. Navy's 250th birthday.

"We celebrate the 15th anniversary of one of the Navy's vital medical research commands in the shadow of the Navy's 250th birthday, mindful that NAMRU Dayton provides the research that forms the foundation of innovation essential to sustaining our Fleet," said Capt. William Howard, commanding officer of NAMRU Dayton.

Prior to the establishment of the Command in 2010, the Environmental Health Effects Laboratory (EHEL) was already located at Wright-Patterson Air Force Base, serving as the U.S. Navy's Toxicology Program of Record. EHEL had previously been relocated to Wright-Patterson in Ohio in 1976 from Bethesda, Md. in order to coordinate efforts with U.S. Air Force partners. Meanwhile, the 2005 Base Realignment and Closure (BRAC) Act directed the relocation of the Naval Aerospace Medical Research Laboratory (NAMRL) from Naval Air Station (NAS) Pensacola in Florida to Wright-Patterson to form the Navy component of a new joint Center of Excellence (CoE) for Aeromedical Research. This CoE placed NAMRL alongside the U.S. Air Force School of Aerospace Medicine and other AFRL elements, creating an combined integrated hub for aerospace medical science. Navy Medicine, recognizing the proximity of two Navy research units on the same installation, decided to combine NAMRL and EHEL under a single command: NAMRU Dayton.

"Navy Medicine's decision to put EHEL and NAMRL under one command brought together two components with unique research missions, each with their own rich history," explained Dr. Karen Mumy, EHEL director. "While our missions may not appear related at face-value, the labs flow together very nicely and, in fact, have had a number of opportunities for collaboration over the last 15 years."

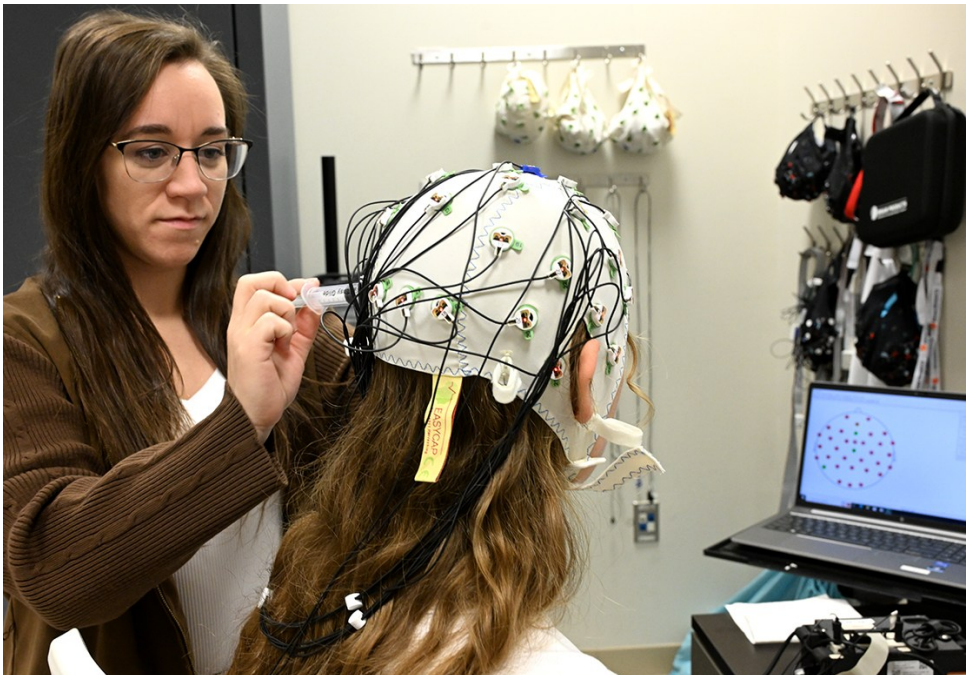
Dr. Rick Arnold, director of NAMRL, noted the potential for growth and increased collaboration with Air Force partners as a result of the creation of NAMRU Dayton.

"Leaving the 'Cradle of Naval Aviation' in Pensacola presented challenges for NAMRL," Arnold said, "but these were more than compensated for by the outstanding new facilities and partnerships for NAMRL at Wright-Patterson, not only with our USAF Aeromedical Research colleagues, but with EHEL who in addition to their outstanding non-aviation research, broadened the capabilities to conduct Aeromedical research at NAMRU Dayton."

NAMRU Dayton was officially established on Oct 1, 2010. Its activation ceremony, held on Oct 6, 2010, was presided over by Capt. Richard Haberberger, commanding officer of what was then Naval Medical Research Center, now Naval Medical Research Command (NMRC). Rear Adm. Eleanor Valentin, commander, Naval Medical Support Command, served as the honored guest speaker. Capt. Keith Syring became the first commanding officer of NAMRU Dayton, with Cmdr. Rita Simmons as the inaugural executive officer.

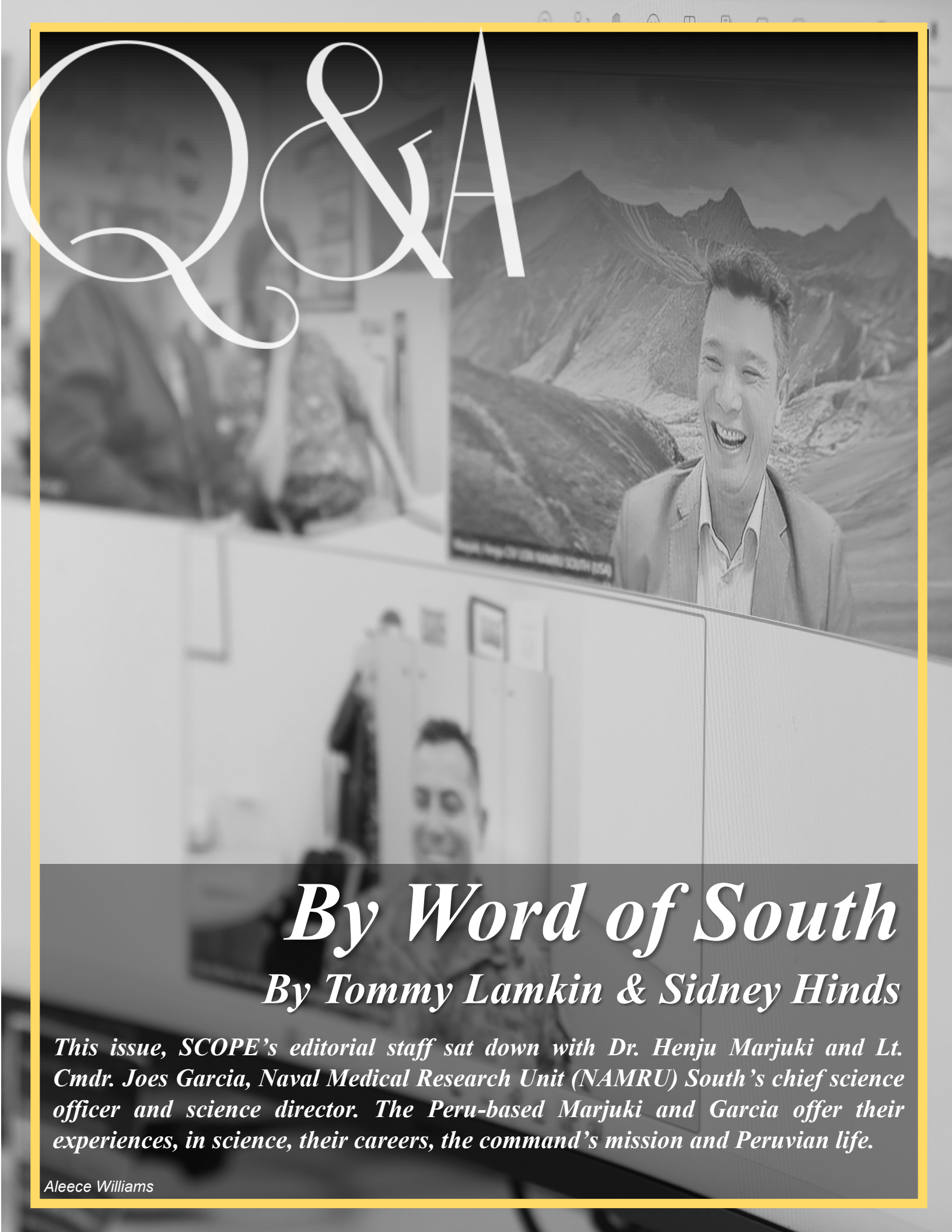
In November 2010, NAMRU Dayton's first organizational chart listed a staff of just 34 personnel. Over the course of 2011, the remaining NAMRL workforce relocated from Pensacola to Dayton. By the end of that fiscal year, NAMRU Dayton had nearly doubled in size to 67 personnel—almost half of its present-day workforce.

Milestones of NAMRU Dayton's early research included foundational work across both its major mission areas. In EHEL, research advanced the landmark "Women in Submarines" study, which demonstrated that submarine atmospheres were safe environments for fetal development, an essential research effort supporting the Navy's decision to integrate women into submarine service. NAMRL, conducting Aerospace and Operational Medicine Research, transferred core programs from Pensacola to Dayton, including spatial disorientation, hypoxia and fatigue countermeasure research. At the time, the Disorientation Research Device (DRD), now known as the Kraken, was little more than an excavation site on the east side of Building 851. Together, these efforts laid the groundwork for the multidisciplinary portfolio NAMRU Dayton manages today.



Supporting the Fleet and the Force since its establishment, NAMRU Dayton has grown into a premier Navy research command focused on understanding environmental exposures, enhancing performance, improving aerospace medical safety and ensuring the health and readiness of warfighters operating in demanding environments. As the Navy marks its 250th year, NAMRU Dayton's mission remains firmly aligned with the fleet's enduring operational needs.

"The relocation of the Navy's Aerospace Medical Research Laboratory to Wright-Patterson Air Force Base carried forward a proud Navy legacy in aerospace medicine, while enabling close collaboration with our Air Force colleagues in Dayton, the birthplace of aviation science," Howard said. "Combined with the enduring tradition of military toxicology here, which includes the embedded support of the Army, NAMRU Dayton has thrived for 15 years in a true tri-service environment, continuing a legacy of innovative contributions to warfighter readiness." ■



Q&A

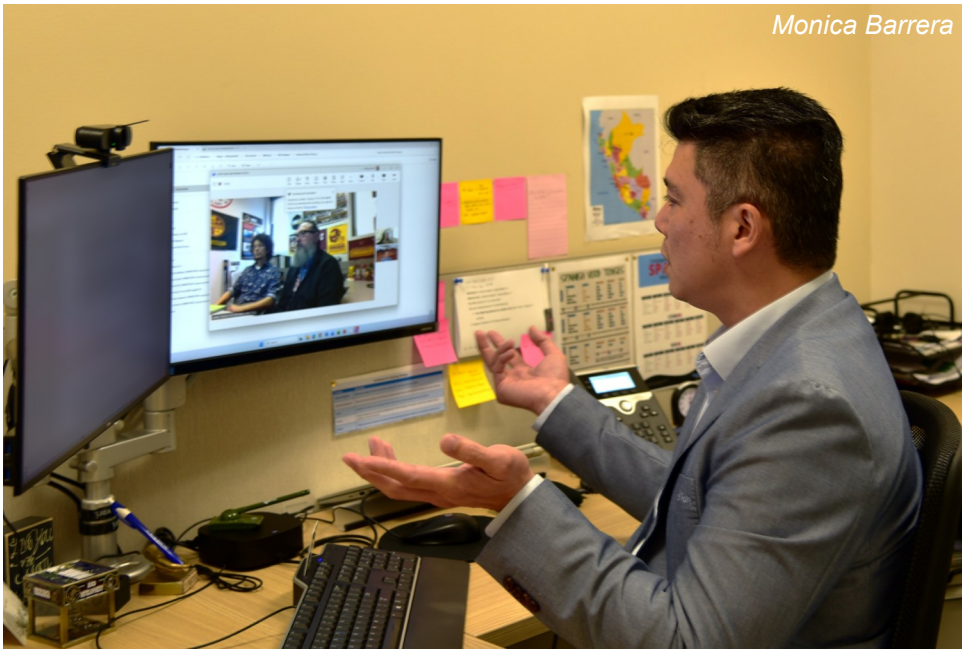
By Word of South

By Tommy Lamkin & Sidney Hinds

This issue, SCOPE's editorial staff sat down with Dr. Henju Marjuki and Lt. Cmdr. Joes Garcia, Naval Medical Research Unit (NAMRU) South's chief science officer and science director. The Peru-based Marjuki and Garcia offer their experiences, in science, their careers, the command's mission and Peruvian life.

Aleece Williams

This interview has been edited for brevity and clarity.


Monica Barrera

Tommy Lamkin: Good to have you both in the room, even if only virtually. To get us started, how did each of you first get into medical research?

Dr. Henju Marjuki: I've always been fascinated by the immune system, specifically its complex network and primary function of defending the body against harmful invaders such as bacteria, viruses and parasites.

I received my PhD in molecular virology, where I studied cell signaling regulation, and cellular responses in the context of influenza virus infections. Following my doctoral studies, I completed 5 years of postdoctoral fellowship on infectious diseases at St. Jude Children's Research Hospital in Tennessee. Subsequently, I joined the U.S. Center for Disease Control and Prevention (CDC) in Atlanta, where I worked for nearly 13 years.

Throughout my tenure at CDC, I took on various leadership roles in public health laboratories. I led the U.S. National Reference Laboratory for bacterial meningitis and also served as the director of the World Health Organization (WHO) collaborating centers to strengthen both domestic and global meningitis disease surveillance programs and outbreak investigations.

Lt. Cmdr. Jose Garcia-Rivera: I've been in the Navy as a Navy microbiologist for almost 12 years now, and my background is in virology. I got my PhD at the University of Texas at El Paso, where my dissertation focused on the characterization of a protein known as LEDGF/p75: a critical cellular factor that is a requirement for HIV integration, thus infection. I completed my postdoc at the Scripps Research Institute in San Diego before joining the Navy. Over there, I worked on the development and evaluation of hepatitis C viral inhibitors.

My path in medical research began a little earlier than that, mostly during college in Puerto Rico, where I started my bachelor's degree in chemistry. During that time, I was completing my degree in chemistry, and I was actually offered the opportunity to work in a molecular biology lab on campus where they did malaria research. I took a quick liking to the work.

After that, I applied to graduate school and got accepted to University of Texas El Paso for their PhD program and basically that's what got me into medical research. From there, again, I did my PhD, postdoc and then joined the Navy again as a microbiologist.

TL: What brought you to NAMRU SOUTH?

JGR: My path has been quite a long journey. I started my career at Naval Medical Research Command or at the time, Center. I thought after my first tour over there in the Navy that I would be coming directly to Peru, but Capt. Pimentel, who was our special leader, at that time sent me in the other direction, to NAMRU-3 in Cairo, Egypt.

From there I went to NAMRU-2 in Cambodia, and NEPMU [Navy Environmental Preventive Medicine Unit]-6 in Pearl Harbor, and before this I was in NAMRU INDO PACIFIC in Vietnam, before I actually made it to NAMRU SOUTH. So, I went the long way around.

TL: Yeah, it sounds like Pimentel tried to keep you out of the country.

LAUGHTER

JGR: I'm very grateful to be here now. It came with good timing, because I have a family now. This is a very family-friendly country.

TL: Dr. Marjuki, how did you end up at NAMRU SOUTH?

HM: I first learned about Navy Medicine during the early stages of my career at the CDC, where I assisted in processing requests for specimens submitted by NAMRU EURAFCENT, which was previously known as NAMRU-3, in Cairo. I also remember my co-workers mentioned the excellence of work done by NAMRU SOUTH and noted their productive collaborations with this Navy command. Fast forward, a few year ago, I felt a strong desire to explore new opportunities outside the CDC, taking on new roles and responsibilities to use and expand my skill set and broaden my knowledge base. In 2022, NAMRU SOUTH was looking for a chief science officer to enhance its scientific portfolio, and long story short, I joined the command in 2023.

TL: You're kind of one-of-a-kind as a command. Can you tell me something significant about NAMRU SOUTH, to include the importance of being stationed down in South America and in the region?

HM: NAMRU SOUTH has been operational since a long-standing agreement with the Peruvian Navy in 1983. This command has been functioning on their hospital bases to conduct essential research on infectious diseases that benefits both the U.S. and Peru. As you may know, the staff at NAMRU SOUTH are predominantly Peruvian. The command addresses the critical need for continuous research and surveillance of infectious diseases in the region, playing a vital role in protecting the health of deployed forces. Emerging and reemerging infectious diseases present a significant health threat in many Latin American countries, and U.S. service members deployed to foreign countries are often exposed to unique diseases, vectors of diseases, contamination from food and water, and wound infections. This NAMRU SOUTH mission is carried out in collaboration with the Peruvian government, its armed forces, and other regional countries, resulting in mutual benefits for the U.S. and its partner nations.

Monica Barrera

JGR: I won't repeat what Dr. Marjuki so eloquently put, but I'll just add on to that. When you compare us to the Army right now. The Army has WRAIR Kenya, WRIAR Georgia and then AFRIMs in Thailand. So they're kind of co-located in similar areas to where we're at, but NAMRU SOUTH is unique in that we do not have an Army sister lab in the region. We cover this whole geographical location, and we're the only research lab in this area. When you compare us to our other sister NAMRUs, NAMRU EURAFCENT and NAMRU INDO PACIFIC, we actually have our own hard structure laboratory facility here, and personnel. Those labs do not have that capability with the closure of Cairo and Cambodia. So, we're the only NAMRU right now that has a physical lab within our compound.

Sidney Hinds: What has that been like for work and for day-to-day life? Operating, not only out of Peru, but also a Peruvian base?

JGR: In practice it's very similar to the day-to-day operations that you all experience at NMRC. We're kind of a base within a base. You would come onto the Peruvian Naval Base, and we do work with them for certain projects, but for the most part our work is concentrated within our own compound.

Another thing that's interesting is that, as NAMRU, we actually have two bosses, NMRC and the U.S. Embassy. We fall under chief of mission authority. So we report directly to the Ambassador as well as the NMRC Commander.

Aleece Williams

TL: That's a unique dynamic. Are there challenges to that?

JGR: For the most part, not really. The embassy supports us very well in-country. They provide us with housing. We go to their team on a weekly basis to brief them on what's happening at the command. They provide embassy services like diplomatic passports and health related support.

SH: So that's I guess the work side of things, how have you found, just living in Peru to be?

JGR: We don't have same day Amazon delivery over here.

SH: Even with the Amazon right there?

LAUGHTER

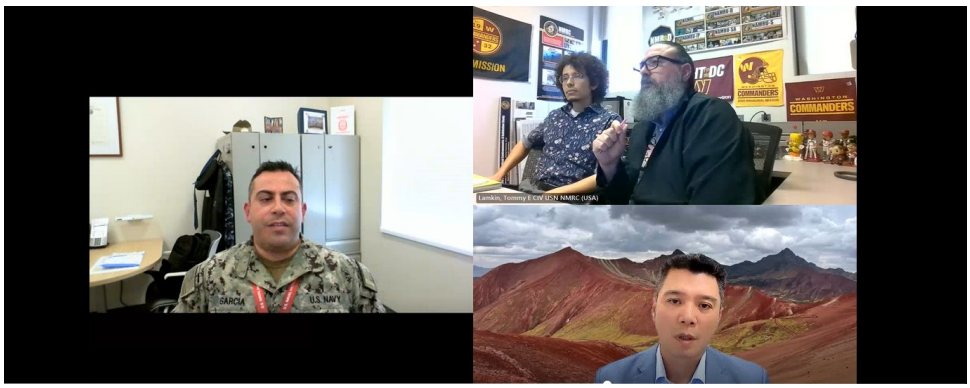
JGR: Living here is awesome. I'm glad that I got this duty station in the middle of my career. When I compare it to my other duty stations, I have to say Cambodia was my best duty station. That's where I met my wife and I got promoted and did a lot of really cool stuff with NAMRU INDO PACIFIC.

This is definitely a second best. The embassy does provide us with government housing and myself and Dr. Marjuki live on the coast, so we have ocean views. The food is excellent. It's probably one of the better duty stations that we have as Navy microbiologists.

TL: Yeah, I've been trying to find a way to get down to Peru. I'm trying to go to Machu Picchu.

LAUGHTER

JGR: Even working here at the command…these are some of the nicest facilities out of all NAMRUs. Our actual buildings and furniture in the buildings are the nicest by far that I've ever worked in.



SH: All the creature comforts.

HM: Peru is a beautiful country, and is generally safe and secure, even in the larger cities. The Peruvian people are warm and friendly, known for their tradition of welcoming hospitality. As Lt. Cmdr. Garcia already mentioned, the cuisine is exceptional, with world-renowned dishes like ceviche. In fact, I don't know if you know this or not, but the number one restaurant in the world is located in Lima, Peru.

SH: In the world?

TL: Really?

HM: Yes! So if you're willing to spend a bit more, you can enjoy some of the finest food available. You'll also find amazing and affordable food options here. Additionally, for me, seeing so many varieties of fruits is incredible, featuring so many types that I can't find in the U.S.

As for the traffic in Lima though, that's a topic for another day.

TL: I've got a little bit of experience with Peru—Peru, IL. That's where my wife's from. And it's not the cuisine capital of the Midwest. Pork tenderloins and raviolis is about as classy as it gets.

LAUGHTER

JGR: Yeah.

SH: What's the best dish that you've had out in Peru? The number one?

JGR: Every time people come out, we recommend the Lomo Saltado. It's cuts of a filet beef cooked with soy sauce, oyster sauce, onions and tomatoes over rice and served with french fries. That's a very nice entry level cuisine into Peru. If people are okay with eating ceviche, then we'd recommend ceviche as well.

HM: My favorite dish is chaufa de mariscos, basically Peruvian wok-fried rice tossed with mixed seafood.

SH: That all sounds really good. You spoke a little bit to how welcoming the local culture is. Have you found that extends with working with the foreign nationals at NAMRU SOUTH?

JGR: We have very long-established relationships with our Peruvian collaborators, and a strong relationship with Peru overall. I've worked in countries before where the relationship with the U.S. wasn't as good; everything had to get pushed all the way up to the highest chains of government, and by the time you're able to start work, it was like a year or two down the road. A country like Peru, where there is a good relationship with the U.S., it gives us a lot more opportunity to get study approvals a lot quicker.

TL: Last year we put out a news story about the Journal of Infectious Disease including an insert in an issue marking the 40th anniversary of NAMRU SOUTH. What about NAMRU SOUTH, previously NAMRU-6, and its history helps drive your mission today?

HM: We take pride in NAMRU SOUTH's long-standing history and relationships with our Peruvian partners and other countries in the region. Over those 40 years, NAMRU SOUTH has collaborated with its partners to reach numerous milestones, resulting in essential information sharing and education regarding infectious diseases that benefits both the U.S. and our regional partners all across Latin America. After four decades, our mission remains unchanged. We will continue to conduct our cutting edge biomedical research and strategic disease surveillance to enhance our understanding of disease, and to improve prevention and treatment options for Force Health Protection.

TL: As I understand it, we maintain a presence in South America to maintain a bigger picture view of which health threats exist there, what makes those threats dangerous, and to learn how we can help address those threats. How do you view that mission?

JGR: Our main mission is to provide surveillance against pathogens within the region. We need to have that big picture and understand what is out there because if there is an event where U.S. service members are in the region, they need to know what they need to be protected against, and what measures they have to do in order to protect themselves against any pathogen or vector in the region. If there is any vaccination they should be taking or if there should be a heightened precaution while in the region – that's the information that we can provide to the service members to improve Force Health Protection.

TL: I went to Africa almost 20 years ago, and remember before we touched down, we had the mission brief and there was a huge slide about malaria and getting sick. We had to take these giant pills and make sure we were drinking plenty of water. I never would have thought that the biggest threat was getting sick.

HM: Right.

TL: It's important work that I don't think that the average Sailor is aware of.

TL: Three years ago, we changed the names of the OCONUS units to shift the numerical naming convention to a more geographical one. We vocalized this with the COCOMs to try to align with what they're doing, and what their missions are. I'm curious about your thoughts on that; has that name change made it harder to have an identity? Or has it helped?

JGR: From my perspective, it makes sense. Other than "EURAFCENT" being a mouthful, "NAMRU SOUTH" and "NAMRU INDO PACIFIC" are much better than "NAMRU-6" and "NAMRU-2" because those prior numerical systems were confusing, not only for collaborators but for the general public. The new names make it clear where our COCOMs are, and improve recognition and understanding. I'm all for it.

TL: What challenges are you facing right now? Do you find that you're helping partners rise and meet their challenges?

JGR: I think a lot of research institutions in the United States are facing similar challenges right now, and it's mainly research funding. Despite that, we continue to work closely with our partners to align our priorities and share resources when possible. That helps ensure that ongoing studies deliver the outcomes and the results that we're hoping for.

Right now, that is a central theme at NAMRU SOUTH, because as you know, for the past few years GEIS (Global Emerging Infections Surveillance) has experienced cuts to their budget. But we're looking at ways around that, and into paths of expanding our reach to other research funding agencies

SH: Of the projects ongoing or coming up, which are you especially excited for? Either for impact or because of the work involved?

JGR: I recently reviewed a proposal from our Virology department, focusing on the efficacy and the durability of a vaccine induced immune response from a new dengue vaccine that was released from Takeda, a Japanese company. It's a two-shot vaccine, designed to protect against all four serotypes with dengue. That is highly important right now, with Peru being a dengue endemic area. They're rolling out pilot studies and seeing how effective this vaccine is.

We're fortunate that we have a cohort of personnel in Iquitos, which is one of our sister labs here in Peru where we have around 250 people enrolled in a dengue cohort. We're looking at whether these people are vaccinated with this vaccine, how long their immunity lasts, and whether mosquitos are able to transmit the virus if they are infected to other people.

This is one of those studies that is highly relevant to us in the region, but also for Force Health Protection. If this vaccine ever gets approved by the FDA, this could provide more evidence to why military personnel should be taking these vaccines prior to coming into the country. That's a proposal that we recently submitted to DHA that I hope to get funded.

Monica Barrera

HM: I've been here two and a half years already, and I've seen a lot of great proposals, projects and studies conducted by our staff. Anything related to novel vaccine development and testing is always dear to my heart, but we engage in a wide range of high profile research and surveillance that focus on infectious diseases, and I do find nearly all our scientific projects to be both exciting and intellectually stimulating.

I have to give kudos to our staff, because our researchers are on the front lines tackling global health challenges, such as emerging pathogens, vector borne diseases as Lt. Cmdr. Garcia mentioned, antimicrobial resistance and of course the testing of novel therapies and vaccines.

TL: Very awesome, okay. What do we think is next for NAMRU SOUTH? What are you hoping to accomplish?

JGR: I just got here last September, but I'm here for the next three years. We have a lot of upcoming developments.

One is the reactivation of our vivarium here at NAMRU SOUTH. We just cut the ribbon on the vivarium about two and a half months ago, so that's going to expand our research capabilities and open up new opportunities for funding and collaboration.

We also have a lot of construction projects going on. We have new laboratory spaces that will be opening, hopefully this quarter or next quarter. Those laboratory spaces would be supporting our sequencing and entomology teams that are currently operating out of mobile labs on our site, so those upgrades are going to strengthen our lab's scientific capabilities.

HM: Also, to add to what LCDR Garcia mentioned regarding what is next for NAMRU SOUTH's mission, we will remain consistent. We are committed to applying cutting edge science to elevate the quality of our infectious disease research. This commitment is essential for developing effective countermeasures, ensuring public health and security, and improving our overall force health protection. I firmly believe the work NAMRU SOUTH is doing addresses the ongoing threats posed by new and re-emerging pathogens, unseen enemies so to speak, as well as increasing cases of antimicrobial resistance.

TL: Tremendous

JGR: Hey Tommy, did you see our new patches?

TL: No, I didn't.

Lt. Cmdr. Garcia moves patch so it appears on the camera.

SH: Oh, shoot, those look great!

TL: That's pretty cool.

JGR: I designed them. Pretty sweet, huh?

SH: You got the Tumi on there and that's Machu Picchu?

JGR: Yeah.

TL: Well, thank you both for jumping on the call today. Looking forward to seeing, hopefully this summer, and maybe bring some ceviche ■

MASTERING THE FIRST BREATH

Navy Medicine Research Fortifies the Warfighter Against Cold's Lethal Shock

Story and photos by
Matthew Reyes

The first plunge into icy water is a shock to the system. For a warfighter operating in extreme cold-weather environments, a fall into near-freezing seas isn't a mishap; it's a life-or-death battle that is won or lost in the first few minutes.

Naval Health Research Center (NHRC) scientists spent six days this winter at the Marine Corps Mountain Warfare Training Center (MWTC) in Bridgeport, California, doing research in the Sierra Nevada. Working in air temperature hovering at 19 degrees Fahrenheit and with water temperatures at 34 degrees, researchers are working to give U.S. warfighters the tools to win that battle.

The project, funded by the Office of Naval Research (ONR), is directly aimed at improving survival rates in a mass casualty incident at sea, such as a torpedoed ship in Arctic waters. Researchers from NHRC's Environmental & Thermal Physiology team are researching cold-environment survival to understand and defeat a silent killer known as the "cold shock response."

"Most people's first worry is hypothermia, but in order to actually become hypothermic, you have to survive the cold shock response," explains Rebecca Weller, a research physiologist with NHRC. "The initial moments in cold water are often the most dangerous, and how you control your breathing in those moments can determine whether you survive."

That initial, involuntary gasp for air upon hitting cold water, the rapid and uncontrolled breathing (hyperventilation), and the spike in heart rate and blood pressure are all hallmarks of cold shock response. This physiological response can quickly lead to aspirating water, cognitive impairment, and drowning. Research suggests that this response is the cause of death in up to 60% of accidental cold-water immersions, long before the body's core temperature begins to drop.

NHRC's Environmental & Thermal Physiology team led by principal investigator Doug Jones, partnered with the MWTC to conduct a vital study during its Cold-Weather Medicine Course. Students (mostly Navy Corpsmen) enrolled in the course prepared for the rigors of cold-weather operations and had the opportunity to volunteer as subjects of an experiment designed to find a simple, effective defense against cold shock.

The day before cold-water immersion, participants underwent baseline testing for stress, anxiety and information recall. They also received specialized training in a simple, powerful technique: slow-paced breathing.

The next morning, volunteers were fitted with an array of sophisticated data-collection devices: Polar heart rate straps, BodyCAP core temperature sensors, and iButton skin temperature monitors. The most critical piece of equipment, however, was a spirometer, which measures the volume and rate of breathing. The goal was to see if a simple breathing exercise could override the body's instinct to panic.

"We are trying to develop a technique and strategy that can limit the stress associated with accidental cold-water immersion," said Jones.

NHRC is currently in the process of analyzing data from these tests. Based on preliminary review of the data, the group trained in slow-paced breathing appears to have demonstrated a lower and more controlled breathing rate during immersion, as compared to the untrained control group. They were actively using the technique to fight the body's involuntary response.

"We are trying to develop a technique and strategy that can limit the stress associated with accidental cold-water immersion"

The team is now analyzing how controlled breathing impacts the cold shock response and operational performance, such as completion of the 9-Line task. During the immersion, participants were tasked with performing a "nine line" medical evacuation request—a standard military procedure that requires clear thought and precise communication. The ability to perform such a task under the intense physiological stress of cold shock can mean the difference between life and death for a service member.

the findings from this research will provide evidence-based data to validate and refine training protocols across the U.S. military. The ultimate goal is to provide the military with evidence-based tools that can be quickly taught to any service member and integrated into official guidance like the U.S. Navy's Cold Weather Handbook for Surface Ships, to add strategies for surviving the initial moments of cold-water immersion.

"How you control your breathing in those initial moments of cold-water immersion can determine whether you survive it," Weller emphasized. "By practicing these techniques in a controlled environment, service members may gain the confidence and muscle memory to execute them when it counts."

These NHRC findings will educate a new generation of warfighters—more prepared, more adaptable, and more lethal, armed with the knowledge to conquer one of nature's most unforgiving environments. They are proving that in the face of the cold's deadly gasp, the most powerful weapon can be a single, controlled breath.

Through a wide range of research, including its cold-water immersion studies, NHRC develops strategies that enable the warfighter to overcome the many health and performance-related challenges they face in the course of their duties. This research provides U.S. Naval, Marine Corps and joint forces with the opportunity to develop tools to maintain cognitive function and enhance survivability in the most extreme maritime environments. ■

Sidney Hinds

NMRC Partnership Receives 510(k) Clearance for XSTAT P15 Wound Treatment Device

By Aleece Williams

The XSTAT P15, an advanced hemorrhage control device for narrow-entrance wounds, recently received 510(k) clearance as part of joint efforts by Naval Medical Research Command (NMRC) in partnership with a medical device company, RevMedx.

This device uses advanced technology in a smaller version of an existing combat casualty wound care device, the XSTAT P30, designed to treat life-threatening, bleeding wounds in deployed and combat environments.

"This represents the first FDA approved method"

Warfighters can use the XSTAT P15 applicator to insert a pouch containing miniature sponges into restricted wound sites, such as those caused by gunshots or shrapnel. As the sponges expand, they exert constant pressure onto the wound, minimizing bleeding without the use of manual compression, lessening the risk of complications and eliminating the need for a tourniquet. Application requires no training, reducing the burden on the warfighter. The pouch that the minisponges are contained in allows them to be easily removed during surgery.

"Previously there were makeshift remedies to try to deal with these types of wounds with varying levels of effectiveness. This represents the first FDA approved method, which has also resolved some of the issues inherent in those makeshift remedies," said Lt. Cmdr. John Casachahua, a product manager for NMRC Naval Advanced Medical Development. "Partnerships like this allow NMRC to create an efficient, focused and agile front that can adapt to the changing needs of military medicine and enhance survivability of our military force in contested environments."

510(k) premarket clearance allows for marketing and distribution of the XSTAT P15 in the U.S., after confirmation that the device is safe and effective. 510(k) clearance requires submitters to compare their device to one that is already legally marketed and prove that it is "substantially equivalent" (SE).

"Partnerships like this allow NMRC to create an efficient, focused and agile front that can adapt to the changing needs of military medicine and enhance survivability of our military force in contested environments"

The XSTAT P15 is intended to help lessen the risk of hemorrhage wounds, which are the cause of approximately 20% of combat wounds across all services.

Aleece Williams

NMRC, headquarters of Navy Medicine Research & Development, is engaged in a broad spectrum of activity from basic science in the laboratory to field studies in austere and remote areas of the world to investigations in operational environments. In support of Navy, Marine Corps and joint U.S. warfighter health, readiness and lethality, researchers study infectious diseases, biological warfare detection and defense, combat casualty care, environmental health concerns, aerospace and undersea medicine, operational mission support and epidemiology. ■

Aleece Williams

LOOKING Aft

with André B. Sobocinski
Historian, Bureau of Medicine and Surgery

"Papa Topside" and the Underwater Frontier: How Project Genesis and SEALAB Redefined Human Limits

"Knowledge of the oceans is more than a matter of curiosity. Our very survival may hinge upon it."

~President John F. Kennedy

As Project Mercury was transporting public imagination to the stars, one Navy medical officer looked to the seas as the new frontier of exploration and habitation.

In 1958, Cmdr. (later Capt.) George Bond proposed an ambitious plan of underwater research that seemed to have been inspired by the writings of Jules Verne. Bond saw a literal untapped ocean of opportunity for mineral mining, marine archeology, biology and colonization that could lead to discoveries of new medicines and harvestable resources. In the 1960s, Bond pioneered the SEALAB program, which would serve as one of the first underwater habitation projects and the first open water experiment in saturation diving.

Before the SEALAB, Bond spearheaded Project Genesis (1957-1963), the first study of saturation diving in an artificial environment. So named for the biblical prophecy of man's "dominion over the sea," the experiments simulated a subsurface environment in a hyperbaric chamber and tested an assortment of gas mixtures that could be used by humans living in an ocean habitat.

The experiments, which took place at the Naval Submarine Medical Research Laboratory in New London, Conn. and the Naval Medical Research Institute (predecessor of today's Naval Medical Research Command) in Bethesda, Md., were overseen by Bond and undersea medical officers Cmdr. Walt Mazzone and Cmdr. Robert Workman. Bond and his team observed both animal and human subjects under various pressures and gas environments in the chamber. Goats were the standard test subjects because of the similarity of their anatomies to humans. Ben Hellwarth, author of SEALAB: America's Forgotten Quest to Live and Work on the Ocean Floor, would assert that the "saturated goats" were to diving and undersea research what monkeys Able and Baker were to the space program. In 1962, Bond, Mazzone and Workman published their initial findings in Genesis: Prolonged Exposure of Animals to Pressurized Normal and Synthetic Atmospheres.

The project ultimately culminated in August and September of 1963 when a Navy medical officer and two chief petty officers spent 12 days at a simulated record ocean depth of 200 feet while breathing artificial air.

Project Genesis established that humans in a saturated state could perform useful functions for extended periods of time underwater. Over the next decades, Genesis findings would unlock potential for marine research, construction, and salvage operations while paving the way for underwater habitation projects of Jacques Cousteau, Edward Link and Bond's SEALAB.

"In the habitat at the end of a busy day looking out a port is in itself a pleasure. There's a lot to see down there if you just have the time. It was like a reversed fish bowl. You get where you recognize fish and other critters. I can remember giving all our fish names and even wondering where they were on the days when we failed to see them"

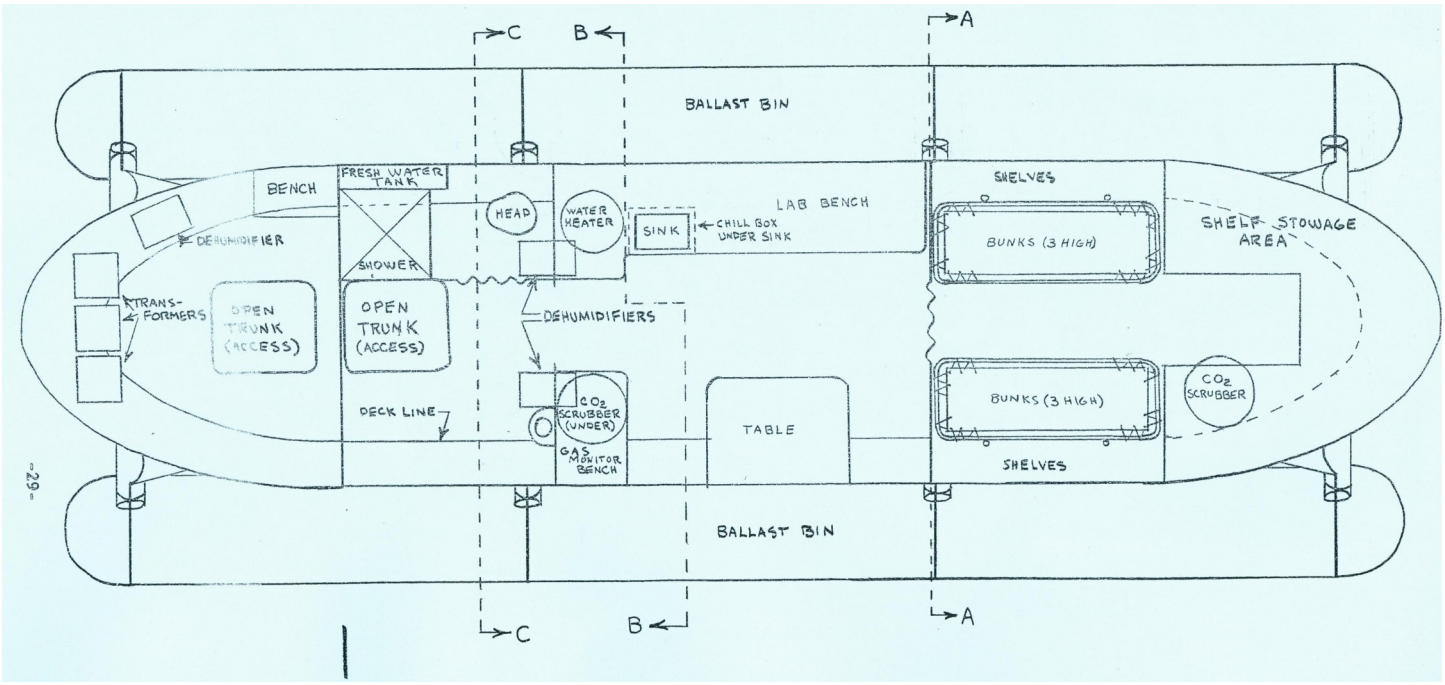
- QMC Bob Barth, Aquanaut, SEALAB II

Capt. George Bond's research had started a race to establish the first underwater habitat. In September 1962, industrialist and inventor of the flight simulator, Edwin Link launched the first and smallest of all the underwater habitats. Measuring just 11 feet tall by 3 feet wide, its sole inhabitant—diver Robert Sténuit—would spend 25 hours at 200 feet below the surface earning the distinction of the "world's first aquanaut."

Just a week later, on September 14, 1962, Jacques Cousteau launched the first of three Continental Shelf Stations (CONSHELF). Since the very beginning of Project Genesis, Bond and Cousteau had been philosophical compatriots in the cause of saturation diving, and had freely shared ideas with one another in that time.

The U.S. Navy Medical Department had a special relationship with Cousteau, extending back to the early 1950s. While with the experimental diving unit, Navy medical officer Lt. Cmdr. (later Rear Adm.) Charles Waite became the first American physician to test Cousteau's self-contained underwater breathing apparatus or SCUBA.

Bond's fellow undersea medical officer, Lt. Cmdr. Charles Aquadro, served as an observer for the CONSHELF project and would later be employed by Cousteau in a civilian capacity. In 1964, as Cousteau was filming "World Without Sun," a documentary about CONSHELF III, Bond's vision of underwater life had germinated into SEALAB. Designed by the U.S. Mine Defense Laboratory in Panama City, Fl., the SEALAB habitat was constructed out of two torpedo-like mine floats measuring 60 feet in length.



SEALAB would be submerged 193 feet below the surface in warm, clear waters 30 miles southwest of Bermuda. Habitation would commence July 20, 1964. SEALAB's "crew" included Chief Quartermaster Bob Barth, Gunner's Mate First Class Lester "Andy" Anderson, Navy physician Lt. Robert Thompson, and Chief Petty Officer Sanders "Tiger" Manning of the Hospital Corps. Mercury astronaut Lt. Cmdr. Scott Carpenter (USN) was selected for the mission, but would sit out the first phase of SEALAB after suffering injuries in a motorbike accident on Bermuda. The aquanauts took daily swims outside the habitat collecting Marine specimens, feeding fish, and conducting physiological tests.

They enjoyed daily meals that included corned beef hash, Chinese food, tamales, roast beef, sweet potatoes, and coffee. Other SEALAB "amenities" included warm showers, books, a chess board and communication devices connecting them "topside," where Bond and medical officer Walter Mazzone monitored the crew around the clock.

Due to the helium-rich atmosphere of the habitat, the aquanauts spoke in high-pitched squeaks and were required to use a "speech normalizer" to ensure intelligibility in communicating topside. Andy Anderson famously inaugurated the system with a rendition of "O Sole of Mio."

Although scheduled to last for three weeks, the SEALAB experiment was ultimately shortened to ten days, due to an approaching hurricane. The SEALAB habitat was raised three feet an hour, and adjustments were made to the breathing gas mixture, accordingly.

Before reaching the surface and being released, the aquanauts spent two days in a submersible decompression chamber.

Despite suffering mild nitrogen narcosis, the aquanauts did not experience any major physiological effects of exposure to deep sea conditions. The SEALAB experiment demonstrated that humans could fully integrate with the ocean environment and complete daily tasks while submerged 200 feet below the surface.

The first government-sponsored underwater habitat, SEALAB was deemed a resounding success and in January 1965 the Navy authorized the continuation of the project.

Commencing August 28, 1965, SEALAB II was an ambitious and, arguably, the most successful U.S. Navy mission to gauge the capabilities of saturation diving and undersea habitation. Planted 205 feet below the ocean surface off the coast of LaJolla, Calif., SEALAB II was a 57-foot habitat that contained a special laboratory, a watch station, a galley, showers, toilets, eleven viewing ports, and living space for 10 aquanauts at a given time.

Over the course of its 45-day mission, the SEALAB capsule accommodated three teams of 10 divers (each team in 15-day increments). These aquanauts would amass a total of 450 saturation dive hours outside the habitat conducting plankton sampling, bioluminescent studies, marine life census while continuing the human and animal physiological studies of the previous mission.

Former Mercury astronaut, Cmdr. Scott Carpenter served as leader for two of the three rotating teams and was only one of two aquanauts to spend one month below the surface (the other being Navy physician Lt. Cmdr. Robert Sonnenberg). Early in the mission, Carpenter made history communicating via "earthlink" with astronaut Gordon Cooper who was then orbiting the planet in his Gemini spacecraft some eight atmospheres away.

This first "Sea-to-Sky" communication feat was soon followed by the first "Sea-to-Sea Habitation" link when SEALAB II exchanged messages with Cousteau's CONSHELF III crew then submerged 330 feet off Villefranche-sur-Mer in the Mediterranean.

SEALAB II also featured the services of a Navy-trained dolphin named "Tuffy." As the unsung 29th member of the team, Tuffy transported much needed supplies and tools to the aquanauts and performed "lost diver" drills. Aquanaut Bob Barth would later recall the first encounter with his bottled-nose colleague.

"Ken [Conda] and I would go outside when the folks topside would tell us they were ready to send Tuffy down. We would wander away from the habitat…and Ken would turn on the pinger device he carried. Before too long, there would be a streaking shadow and a giant swoosh, and then this damn big fish would be sitting right in front of us, smiling. The first time that he roared down on us scared the hell out of me…"

The success of SEALAB II ensured the continuation of the project, and in February 1969, the third phase was launched. Now 45-aquanaut strong (five teams of nine), the SEALAB III habitat was submerged 610-feet below the ocean surface off San Clemente Island, California. Immediately, the habitat (modified SEALAB II capsule) began to leak, and teams of aquanauts were sent down to conduct repairs.

On one such visit, aquanaut Berry Cannon died suddenly of what was later determined to be carbon dioxide poisoning on account of a faulty "rebreather." With Cannon's death, and fear of bad publicity, the third phase of the program, as well as the program itself, was cancelled. In frustration, one aquanaut later commented that the mission to the moon survived three astronaut deaths, and no one in that program quit; rather, it drove NASA to "bigger and better things."

Bond's dream may have dimmed with the abrupt cancellation of SEALAB III, but the scientific foundation he poured remains the bedrock of modern undersea operations. While Cannon's death halted the Navy's pursuit of permanent seafloor bases, it could not erase the reality that Bond had proven: the ocean was no longer a barrier, but a potential habitat.

Today, the "saturation" techniques pioneered in the hyperbaric chambers of Project Genesis are the industry standard for commercial diving, enabling the complex underwater construction and salvage operations. From the long-term research conducted at the Aquarius Reef Base to the record-breaking dives exceeding 2,000 feet, the boundaries of human endurance continue to expand along the path Bond blazed.

To be certain, Bond was more than a medical officer; he was the architect of a new human identity—the aquanaut. His posthumous recognition by the Historical Diving Society with the "Diving Pioneer Award" and his prominence in modern documentaries and books serve as a testament to a man who looked at the crushing pressures of the abyss and saw a new frontier of exploration. Bond's legacy endures in every diver who breathes a synthetic mix and every scientist who calls the ocean floor their laboratory, proving that while we may have reached for the stars, our survival and our future remain inextricably tied to the silent world beneath the waves. ■

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"If need be, we could work well into the night, as it didn't make a lot of difference to the bottom dwellers. Days looked like nights; it was dark on the bottom all the time"

QMC Bob Barth, Aquanaut, SEALAB II

Ahnen continued from page 3

"These events are very important to connect with the business community and the military community," said Megan Gilbert, vice president of the Chamber of Commerce of Eastern Connecticut. "We offer breakfast and words of encouragement as a small token of our appreciation."

Ahnen was recognized at the conclusion of the ceremony, both for his leadership in the local community, and for his dedication to service in his position as leading petty officer and dive supervisor in the NSMRL dive department.

"Like many awardees, I don't do what I do expecting an award, but my mom always told me that if you can't be the reason someone smiles today, absolutely don't be the reason they frown," said Ahnen in his acceptance speech. "I really try to live by the 'just be helpful' mantra, so it's an amazing honor to be recognized for that."

Ahnen has supported many local schools for STEM nights and career days, volunteered for Navy Week outreach, Scouts of America day, Earth Day cleanups, and other base-wide volunteer events. He is also a sexual assault victim advocate for Submarine Base New London.

"Today we celebrate the chambers' Serviceperson of the Year, which is the culmination of the chambers' serviceperson of the month program with all the local servicemembers of the area," said Litty during his remarks. "Recognizing the servicemembers of southeastern Connecticut for their work and dedication in their job, but most importantly, in the strong community we have here in southeastern Connecticut is truly amazing." ■

Jamros continued from page 4

NAMRU EURAFCENT supports the fleet by assessing infectious disease risks that commonly impact deployed units, including gastrointestinal and febrile illnesses. Work like Jamros' at the command helps develop research protocols, collaborates with partner militaries and host-nation medical professionals and analyzes data collected during field studies. The command's work informs prevention strategies and treatment guidance used by military medical providers.

In September, NAMRU EURAFCENT led research efforts at Camp Lemonnier, Djibouti, focused on improving treatment options for infectious diarrheal diseases. These illnesses remain a frequent cause of lost duty time in deployed settings.

"Every time, we return better aligned and more capable of achieving results that matter for both our forces and our partners"

The research aims to improve outcomes for warfighters and sustain unit readiness in austere environments.

Field research often presents logistical challenges, particularly in remote locations. Jamros explained that each exercise strengthens coordination and improves the command's ability to execute future studies.

"Every time, we return better aligned and more capable of achieving results that matter for both our forces and our partners," Jamros said.

The command's partnerships with allied and host-nation organizations are essential to mission success. Jamros plays a role in sustaining these relationships, which enable research access, improve regional medical capacity and support U.S. operational capabilities. ■

SCOPE NEWS

Established 2021 *"A closer look at Navy Medicine Research & Development"* **Vol I Issue X**

SILVER SPRING (Feb. 10, 2026) Deborah Sharpe, a contract specialist for Naval Medical Research Command (NMRC), accepts her retirement award at command All-hands. Sharpe, known around the command as Ms. Deb, joined Armed Forces Institute of Pathology in 1976, supporting logistics and processing purchase requests while still in high school through a Stay-in-School Program. She later went on to graduate from the University of the District of Columbia (UDC).

In 1983, Sharpe joined the Uniformed Services University of the Health Sciences (USUHS) as a full-time clerk. She joined the Naval Criminal Investigative Service (NCIS) in 1986 as a purchasing agent and contracting specialist. Following that position, in 2007, Sharpe joined NMRC. During her time with NMRC, where she earned multiple recognitions, including Junior Civilian of the First Quarter of 2022 and the Civilian Service Achievement Medal in April 2023.

"The work here has been challenging at times, but it has also been rewarding," Sharpe said. "I've been blessed to work with some wonderful people at NMRC." — *Aleece Williams*

SCOPE NEWS

Established 2021 *"A closer look at Navy Medicine Research & Development"* Vol I Issue X

LIMA, Peru (Jan 27, 2025) Staff with NAMRU SOUTH pose outside of command headquarters with Richard L. Buck and his spouse. Buck, a former Navy Captain, served as the Officer in Charge of NAMRU SOUTH when it was known as Naval Medical Research Institute Detachment (NAMRID), from 1988 to 1991. — *Monica Barrera*

SILVER SPRING, Md. (Dec. 12, 2025) Sailors with NMRC show their spirit and support for the U.S. Naval Academy football team during a joint WRAIR-NMRC spirit day ahead of the annual Army-Navy game. The Navy Midshipmen would go on to secure a 17-16 victory over the Army Black Nights in a close competition the following day. — *Sidney Hinds*

LIMA, Peru (Feb. 27) ▶NAMRU SOUTH staff share ongoing research with Bernie Navarro, U.S. Ambassador to Peru. — *Monica Barrera*

SIGONELLA, Italy (Feb. 24, 2026) ▼ NAMRU EURAFCENT sailors pose in front of the command headquarters. — *Stephanie Serna*

SCOPE NEWS

Established 2021 *"A closer look at Navy Medicine Research & Development"* Vol I Issue X

SAN ANTONIO (Feb. 9, 2026) U.S. Army Spc. Tyler Houchin, assigned to Naval Medical Research Unit (NAMRU) San Antonio, participates in the annual Soldier, Non-Commissioned Officer and Officer of the Year Competition hosted by Public Health Command, West. Houchin was selected as one of the command's Best Leaders for Fiscal Year 2026. — *Burrell Parmer*

GROTON, Conn (Feb. 19) ▶Naval Submarine Medical Research Laboratory (NSMRL) scientists give a tour of the command's state-of-the art sound suite during a visit by Rear Adm. Robert Hawkins, Commander, Naval Medical Forces Atlantic (NMFL). — *Lt. Tiffany Lui*

SAN DIEGO (Jan. 22) Research Physiologist Lt. Joseph Gordon III of Naval Health Research Center leads a discussion on wearable devices. The development of such devices has aided NHRC's Command Readiness Endurance and Watchstanding (CREW) team in developing an operational fatigue risk management system that collects sleep data in order to monitor Sailor readiness. — *John Marciano*

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